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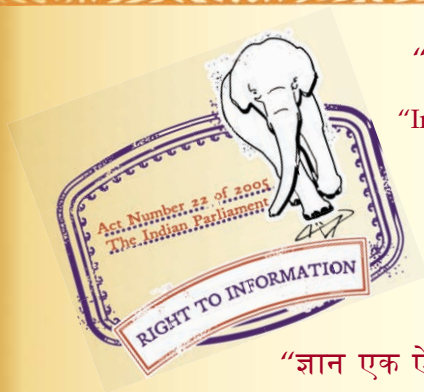
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IS 6500 (1972): Thermometers for measurement of sea surface temperatures [CHD 10: Glassware]



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Indian Standard

SPECIFICATION FOR
THERMOMETER FOR MEASUREMENT
OF SEA SURFACE TEMPERATURE

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INDIAN STANDARDS INSTITUTION
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Indian Standard

SPECIFICATION FOR THERMOMETER FOR MEASUREMENT OF SEA SURFACE TEMPERATURE

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Indian Standard

SPECIFICATION FOR THERMOMETER FOR MEASUREMENT OF SEA SURFACE TEMPERATURE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 24 January 1972, after the draft finalized by the Laboratory Glassware and Related Apparatus Sectional Committee had been approved by the Chemical Division Council.

0.2 The accurate measurement of sea surface temperature is of great importance for meteorology. The most common method of measuring the temperature of the sea surface is by the 'bucket method' in which a suitably designed bucket is lowered into the sea and a sample of sea water from the surface is collected; the temperature of the sample is measured as quickly as possible with a sea surface thermometer enclosed in a metal sheath.

0.3 Specification for thermometer for measuring the sea surface temperature has been drawn up by the India Meteorological Department, but so far no Indian Standard for this exists. In view of the importance of standardization, the formulation of an Indian Standard for the thermometer to measure the sea surface temperature has become necessary.

0.4 This standard contains clause 8.2 which provides for agreement between the purchaser and the supplier.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements for thermometer for measuring the temperature of water at the surface layers of the sea.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 2627-1963* shall apply.

3. TYPE, CALIBRATION AND IMMERSION

3.1 Type — The thermometer shall be of the liquid-in-glass solid-stem type.

3.2 Calibration and Immersion — The thermometer shall be calibrated in degrees Celsius for vertical total immersion.

4. REQUIREMENTS

4.1 Materials

4.1.1 Glass — The stem and bulb tubing of the thermometer shall conform to IS : 4610-1968†.

4.1.2 Thermometric Liquid — Recommended thermometric liquid is pure and dry mercury.

4.2 Construction

4.2.1 The thermometer shall conform to the shape prescribed in Fig. 1. The stem shall be straight and the cross section of the capillary tube shall be such that the mercury thread is easily distinguishable.

4.2.2 No enlargement of bore shall be permissible in the graduated portion of the stem or within 10 mm from either end of the scale.

4.2.3 Bulb — The shape and finish of the bulb shall be such as not to entrap the thermometric liquid.

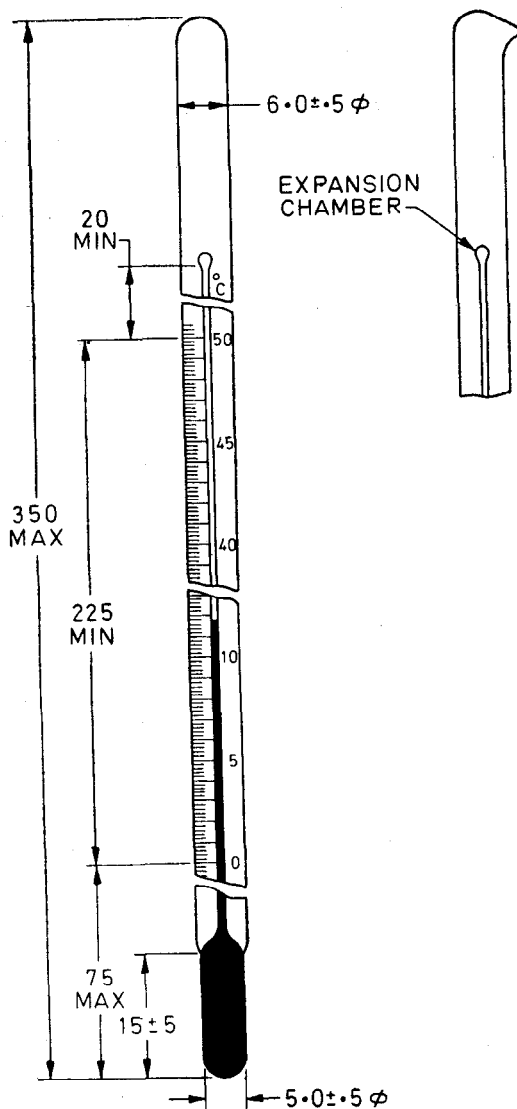
4.2.3.1 The bulb shall be cylindrical and in alignment with the stem.

4.2.4 Top Finish — The top of the thermometer stem shall be finished smooth and shall have a bent nib as shown in Fig. 1.

4.2.5 Expansion Chamber — The thermometer shall be so constructed as to withstand a temperature of 65°C without damage. An elongated or pear-shaped expansion chamber with a hemispherical top and without re-entrant shoulders shall be provided at the top end of the capillary in line with the capillary bore to enable the thermometer to withstand the above temperature.

*Glossary of terms relating to liquid-in-glass thermometers.

†Specification for glass tubes for general purpose and reference thermometers.



All dimensions in millimetres.

FIG. 1 THERMOMETER FOR MEASUREMENT OF SEA SURFACE TEMPERATURE

5. DIMENSIONS

5.1 The dimensional and scale requirements of the thermometer shall be as given in Table 1 read with Fig. 1.

TABLE 1 DIMENSIONAL AND SCALE REQUIREMENTS OF THERMOMETER FOR MEASUREMENT OF SEA SURFACE TEMPERATURE

Sl. No.	PARTICULARS	REQUIREMENTS
(1)	(2)	(3)
i)	Nominal range	0 to 50°C
ii)	Smallest scale division	0.2°C
iii)	Overall length, <i>Max</i>	350 mm
iv)	Length of scale, <i>Min</i>	225 mm
v)	Length of the bulb	15 ± 5 mm
vi)	External diameter of the bulb	5.0 ± 0.5 mm
vii)	External diameter of the stem	6.0 ± 0.5 mm
viii)	Distance of the 0°C mark from the bottom of the bulb, <i>Max</i>	75 mm

6. GRADUATION AND FIGURING

6.1 The thermometer shall be suitably annealed before graduation.

6.2 The graduation lines shall be clearly engraved on the stem. They shall be of uniform thickness not exceeding 0.15 mm. They shall be filled with a pigment which shall not fade or chip off on wiping with a soft cloth after the thermometer has been dipped for 20 minutes in a 16 percent (*m/v*) solution of sodium chloride in water, maintained at $50 \pm 2^\circ\text{C}$.

6.3 The graduation lines shall be at right angles to the axis of the thermometer when the thermometer is viewed from the front in a vertical position. They shall all finish on an imaginary line parallel to the axis on the left hand side.

6.4 Every small division shall be shown by a line 2 mm long. Long graduation lines shall be 4 mm long.

6.4.1 The main scale shall extend on either side of the nominal range by at least 3 smallest scale divisions.

6.4.2 The small graduation lines shall not extend beyond the bore.

6.5 The graduation at 0°C and subsequent marks in steps of 5 degrees of the scale shall be figured on the stem on the right hand side as shown in Fig. 1.

6.6 The figures shall be upright and placed in such a way that they are bisected by an extension of the line. Alternately, the figures shall be placed immediately above the extended line to which they refer.

7. ACCURACY

7.1 Every thermometer shall be accurate to within 1 smallest scale division of the scale.

8. MARKING AND PACKING

8.1 Marking — Each thermometer shall be legibly and permanently marked with the following information:

- a) The letter 'C' near the top of the scale;
- b) Maker's name or recognized trade-mark, if any, at the back of the thermometer; and
- c) Serial number and year of manufacture.

8.1.1 The thermometer may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

8.2 Packing — Each thermometer shall be packed as agreed to between the purchaser and the supplier.

9. TESTING AND INSPECTION

9.1 Each thermometer shall individually comply with all the requirements of this specification. The calibration tests shall be carried out in accordance with IS : 6274-1971*.

*Methods of calibrating liquid-in-glass thermometers.

INDIAN STANDARDS

ON

LABORATORY GLASSWARE

IS:

- 878-1956 Graduated measuring cylinders
- 915-1958 One-mark graduated flasks
- 1117-1958 One-mark pipettes
- 1381-1959 Boiling flasks (narrow-necked)
- 1388-1959 Reagent bottles
- 1541-1959 Glass filter funnels
- 1574-1960 Glass weighing bottles
- 1575-1960 Separating funnels
- 1590-1960 Glass filter flasks
- 1672-1967 Floating dairy thermometers (*first revision*)
- 1996-1962 Glass stopcocks
- 1997-1967 Burettes (*first revision*)
- 2480-1964 General purpose glass thermometers
- 2618-1963 Test-tubes
- 2619-1971 Glass beakers
- 2620-1963 Distilling flasks
- 2626-1972 Petri dishes (*first revision*)
- 2627-1963 Glossary of terms relating to liquid-in-glass thermometers
- 3055-1965 Clinical thermometers
- 3104-1965 Density hydrometers
- 3608-1966 Glass alcoholometers
- 4161-1967 Nessler cylinders
- 4162-1967 Graduated pipettes
- 4426-1967 Methods of sampling laboratory glassware and medical glass instruments
- 4529-1968 Glass tubes for medical thermometers
- 4610-1968 Glass tubes for general purpose and reference thermometers
- 4825-1968 Laboratory and reference thermometers
- 4849-1968 Rain measures
- 5165-1969 Interchangeable conical ground-glass joints
- 5681-1970 General meteorological thermometers, liquid-in-glass
- 5717-1970 Pyknometers
- 5725-1970 Psychrometers, unventilated (dry and wet bulb hygrometers)
- 6017-1971 Thermometer for whirling psychrometers
- 6052-1970 Glass condensers
- 6128-1971 Desiccators
- 6274-1971 Methods of calibrating liquid-in-glass thermometers
- 6500-1972 Thermometer for measurement of sea surface temperature

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Brushware	Painters' materials (miscellaneous)
Ceramicware, enamelware and laboratory porcelain	Paper and its products
Chemical hazards and safety	Paper and pulp board packaging materials
Chemicals, inorganic (miscellaneous)	Perfumery materials, natural and synthetic
Chemicals, organic (miscellaneous)	Petroleum and petroleum products
Coal and coke	Photographic chemicals
Coal carbonization products	Pigments and extenders
Coated fabrics	Plastics
Cosmetics and toilet goods	Polishes
Drying oils	Printing inks
Dye intermediates	Ready mixed paints and enamels
Electroplating chemicals	Rubber and rubber products
Explosive and pyrotechnic materials	Soaps and other surface active agents
Fertilizers	Tanning materials and allied products
Fillers, stoppers and putties	Thermal insulation materials
Footwear	Thinners and solvents
Glass and glassware	Varnishes and lacquers
Industrial gases	Water and water treatment
Inks and allied products	Water based paints
Laboratory glassware, thermometers and related apparatus	Unclassified
Lac and lac products	
Leather, leather goods and leather dressings	

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